TEST REPORT

of

FCC Part 15 Subpart C AND CANADA RSS-247

☒ New Application; ☐ Class I PC; ☐ Class II PC

Product :	**J129 IP Deskphone**
Brand:	**Avaya**
Model:	**J129**
Model Difference:	**N/A**
FCC ID:	**TYM-J129**
IC:	**3794C-J129**
FCC Rule Part:	**§15.247, Cat: DTS**
IC Rule Part:	**RSS-247 issue 1: 2015**
	RSS-Gen issue 4: 2014
Applicant:	**AVAYA**
Address:	**250 Sidney Street, Belleville, Ontario k8P 3Z3, Canada**

Test Performed by:
International Standards Laboratory
<Lung-Tan LAB>
*Site Registration No.
BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3;

*Address:
No. 120, Lane 180, Hsin Ho Rd.
Lung-Tan Dist., Tao Yuan City 325, Taiwan
*Tel : 886-3-407-1718; Fax: 886-3-407-1738

Report No.: **ISL-16LR194FC**
Issue Date : **2016/09/13**

VERIFICATION OF COMPLIANCE

Applicant:	AVAYA
Product Description:	J129 IP Deskphone
Brand Name:	Avaya
Model No.:	J129
Model Difference:	N/A
FCC ID:	TYM-J129
IC:	3794C-J129
Date of test:	2016/07/22 ~ 2016/09/12
Date of EUT Received:	2016/07/22

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:	Dino Chen ***Dion Chang / Engineer***	***Date:***	2016/09/13
Prepared By:	Eva Kao ***Eva Kao / Technical Supervisor***	***Date:***	2016/09/13
Approved By:	Vincent Su ***Vincent Su / Technical Manager***	***Date:***	2016/09/13

Version

Version No.	Date	Description
00	2016/09/13	Initial creation of document

Table of Contents

1 GENERAL INFORMATION

General:

Product Name:	J129 IP Deskphone
Brand Name:	Avaya
Model Name:	J129
Model Difference:	N/A
Operation Environment	Indoor used
TPC	No
DFS	No
Power Supply:	48Vdc from POE adapter

IC RSS-Gen:

Product SW version	FW_S_J129_R2_0_0_0_0b248
Product HW version	14124-1
Radio SW version	FW_S_J129_R2_0_0_0_0b248
Radio HW version	15329-1A

	FCC	IC
RF power setting in TEST SoftWare	2.4G : b mode : low(17) mid(17) high(16) g mode : low(13) mid(13) high(13) n20 mode : low(13) mid(13) high(12) n40 mode : low(13) mid(13) high(12) 5G : B1 a mode : low(17) mid(17) high(17) n20 mode : low(13) mid(13) high(13) n40 mode : low(13) high(13) ac mode : CH 42 5210MHz(12) B4 a mode : low(17) mid(17) high(17) n20 mode : low(13) mid(13) high(13) n40 mode : low(13) high(13) ac mode : CH 155 5775MHz(12)	2.4G : b mode : low(17) mid(17) high(16) g mode : low(13) mid(13) high(13) n20 mode : low(13) mid(13) high(12) n40 mode : low(13) mid(13) high(12) 5G : **B1** **a mode : low(14) mid(14) high(14)** **n20 mode : low(11) mid(11) high(11)** **n40 mode : low(11) high(11)** **ac mode : CH 42 5210MHz(11)** B4 a mode : low(17) mid(17) high(17) n20 mode : low(13) mid(13) high(13) n40 mode : low(13) high(13) ac mode : CH 155 5775MHz(12)

Power Tolerance: +/- 1 dB

Measured Power Level for FCC

WLAN: 1TX/1RX

Wi-Fi	Frequency Range (MHz)	Channels	Peak / Average Rated Power	Modulation Technology
802.11b	2412 – 2462(DTS)	11	19.74dBm (PK)	DSSS
802.11g	2412 – 2462(DTS)	11	22.26dBm (PK)	OFDM
802.11n (2.4G)	HT20 2412 – 2462(DTS)	11	22.17dBm (PK)	
	HT40 2422 – 2452(DTS)	7	22.17dBm (PK)	
802.11a	5180 – 5240(NII)	4	17.45dBm (AV)	
	5745 – 5825(NII)	5	13.51dBm (AV)	
802.11n(5G)	HT20, 5180 – 5240(NII)	4	16.79dBm (AV)	
	HT20, 5745 – 5825(NII)	5	12.38dBm (AV)	
	HT40, 5190 – 5230(NII)	2	15.33dBm (AV)	
	HT40, 5755 – 5815(NII)	2	13.85dBm (AV)	
802.11ac	HT80, 5210(NII)	1	20.14dBm (AV)	
	HT80, 5775(NII)	1	19.87dBm (AV)	
Modulation type		CCK, DQPSK, DBPSK for DSSS 256QAM.64QAM. 16QAM, QPSK, BPSK for OFDM		
Antenna Designation		Fixed Chip Antenna WiFi 2.4G Antenna : 2.1 dBi WiFi 5G Antenna : 2.4 dBi		

The EUT is compliance with IEEE 802.11 a/b/g/n/ac Standard.

Measured Power Level for IC
WLAN: 1TX/1RX

Wi-Fi	Frequency Range (MHz)	Channels	Peak / Average Rated Power	Modulation Technology
802.11b	2412 – 2462(DTS)	11	19.74dBm (PK)	DSSS
802.11g	2412 – 2462(DTS)	11	22.26dBm (PK)	OFDM
802.11n (2.4G)	HT20 2412 – 2462(DTS)	11	22.17dBm (PK)	
	HT40 2422 – 2452(DTS)	7	22.17dBm (PK)	
802.11a	5180 – 5240(NII)	4	16.95dBm EIRP (AV)	
	5745 – 5825(NII)	5	13.51dBm (AV)	
802.11n(5G)	HT20, 5180 – 5240(NII)	4	17.17dBm EIRP (AV)	
	HT20, 5745 – 5825(NII)	5	12.38dBm (AV)	
	HT40, 5190 – 5230(NII)	2	16.27dBm EIRP (AV)	
	HT40, 5755 – 5815(NII)	2	13.85dBm (AV)	
802.11ac	HT80, 5210(NII)	1	22.54dBm EIRP (AV)	
	HT80, 5775(NII)	1	19.87dBm (AV)	
Modulation type		CCK, DQPSK, DBPSK for DSSS 256QAM.64QAM. 16QAM, QPSK, BPSK for OFDM		
Antenna Designation		Fixed Chip Antenna WiFi 2.4G Antenna : 2.1 dBi WiFi 5G Antenna : 2.4 dBi		

The EUT is compliance with IEEE 802.11 a/b/g/n/ac Standard.

This report applies for Wifi frequency band 2400MHz- 2483.5MHz

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.1 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: TYM-J129** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules and **IC: 3794C-J129** filing to comply with Industry Canada RSS-247 issue 1: 2015.

1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in, ANSI C63.10: 2013 and RSS-Gen issue 4: 2014. Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document: 558074 D01 DTS Meas Guidance v03r05

1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist., Tao Yuan City 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.10: 2013. FCC Registration Number is: 872200; Designation Number is: TW1036, Canada Registration Number: 4067B-3.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.

2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 6 of ANSI C63.10: 2013 and RSS-Gen issue 4: 2014. Con-ducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR 16-1-1 Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m/1.5m(Frequency above 1GHz) above ground plane. The turn table shall rotate 360 degrees to determine the position of maxi-mum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 6 and 11 of ANSI C63.10: 2013.

2.4 Configuration of Tested System

Fig. 2-1 Configuration

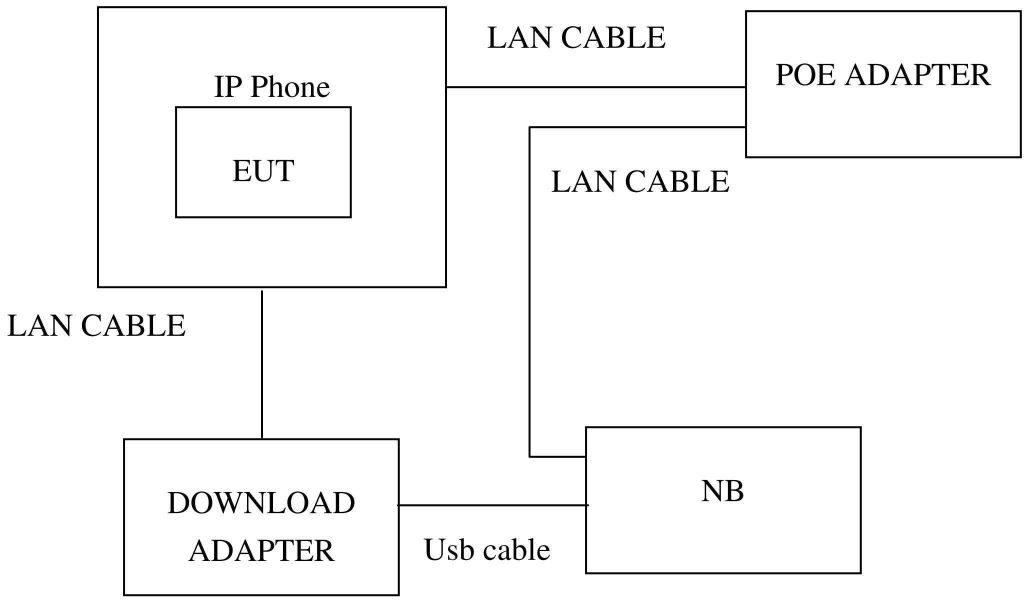


Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	NB	Dell	LATITUDE 3340	481.06F01.0003	NA	Non-shielded
2	IP Phone	AVAYA	J129	16WZ2620003T	Non-shielded	Non-shielded
3	DOWN-LOAD ADAPTER	AVAYA	FWADPT1A-003	09WZ30551803	Non-shielded	Non-shielded
4	POE Adaptor	AVAYA	POE	C15316640000000210	Non-shielded	Non-shielded

3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§15.207(a) RSS-Gen §8.8	AC Power Line Conducted Emission	Compliant
§15.247(b) (3),(4) RSS-247 issue 1,§5.4(4)	Peak Output Power/ EIRP	Compliant
§15.247(a)(2) RSS-247 issue 1, §5.2(1) RSS-Gen §6.6	6dB & 99% Power Bandwidth	Compliant
§15.247(d) RSS-247 issue 1, §5.5	100 KHz Bandwidth Of Frequency Band Edges	Compliant
§15.247(d) RSS-247 issue 1, §5.5	Spurious Emission	Compliant
§15.247(e) RSS-247 issue 1, §5.2(2)	Peak Power Density	Compliant
§15.203 RSS-GEN 8.3	Antenna Requirement	Compliant

4 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering operating condition.
Test program used to control the EUT for staying in continuous transmitting mode is programmed.

2.4GHz:
802.11 b mode: Channel low (2412MHz)、mid (2437MHz)、high (2462MHz) with 1Mbps lowest data rate are chosen for peak output power, band edge, radiated spurious emission testing.

802.11 g mode: Channel low (2412MHz)、mid (2437MHz)、high (2462MHz) with 6Mbps lowest data rate are chosen for peak output power, band edge, radiated spurious emission testing.

802.11 n _20MHz: Channel low (2412MHz)、mid (2437MHz)、high (2462MHz) with 6.5Mbps lowest data rate are chosen for peak output power, band edge, radiated spurious emission testing.

802.11 n _40MHz: Channel low (2422MHz)、mid (2437MHz)、high (2452MHz) with 13.5Mbps lowest data rate are chosen for peak output power, band edge, radiated spurious emission testing.

The worst case 802.11g mode was reported for Radiated Emission.

5 CONDUCTED EMISSION TEST

5.1 Standard Applicable:

According to §15.207 and RSS-Gen §7.2.4, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range MHz	Limits dB(uV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Note
1.The lower limit shall apply at the transition frequencies
2.The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

5.2 Measurement Equipment Used:

AC Power Line Test Site					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Conduction 04-3 Cable	WOKEN	CFD 300-NL	Conduction 04 -3	07/27/2016	07/26/2017
EMI Receiver 17	Rohde & Schwarz	ESCI 7	100887	09/08/2015	09/07/2016
LISN 18	ROHDE & SCHWARZ	ENV216	101424	02/11/2016	02/10/2017
LISN 19	ROHDE & SCHWARZ	ENV216	101425	03/12/2016	03/11/2017
Test Software	Farad	EZEMC Ver:ISL-03A2	N/A	N/A	N/A

5.3 EUT Setup:

1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.10: 2013.
2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
3. The LISN was connected with 120Vac/60Hz power source.

5.4 Measurement Procedure:

1. The EUT was placed on a table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

5.5 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.

AC POWER LINE CONDUCTED EMISSION TEST DATA

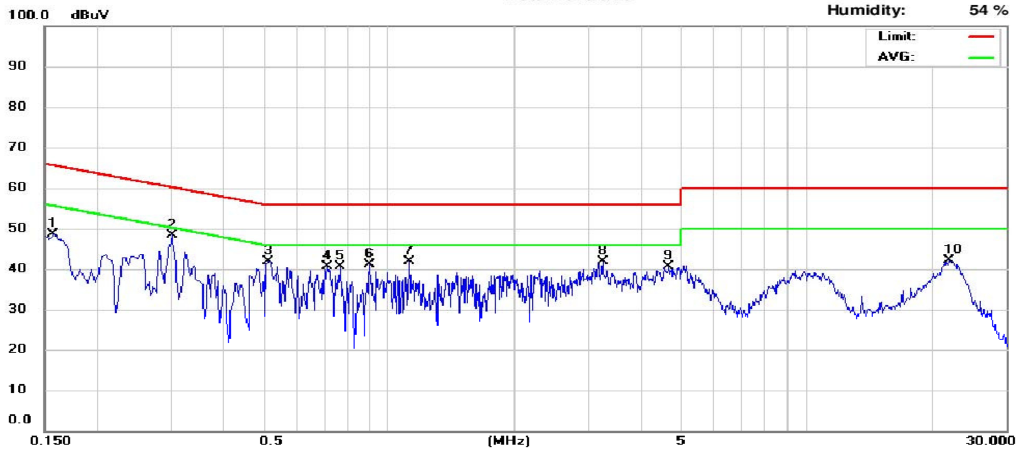
Operation Mode:	Operation Mode	Test Date:	2016/08/15
Test By:	Lake		

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718

Conducted Emission Measurement

Date: 2016/8/15

operator: Jiin Lee
Temperature: 26 ℃
Humidity: 54 %



Site: Conduction 04
Phase: L1
Limit: CISPR22 Class B Conduction(QP)

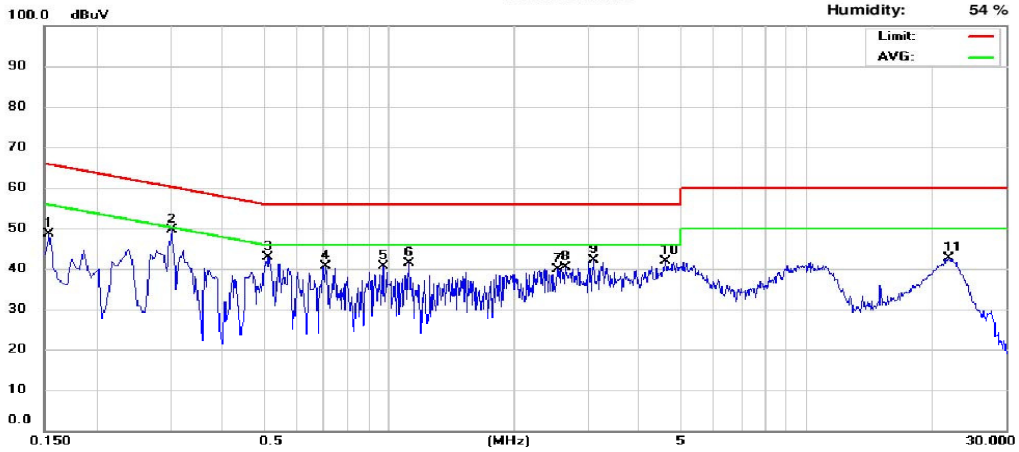
No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.158	34.34	18.14	9.69	44.03	65.57	-21.54	27.83	55.57	-27.74
2	0.302	39.62	37.84	9.69	49.31	60.19	-10.88	47.53	50.19	-2.66
3	0.518	28.37	22.50	9.70	38.07	56.00	-17.93	32.20	46.00	-13.80
4	0.714	25.97	21.53	9.71	35.68	56.00	-20.32	31.24	46.00	-14.76
5	0.766	22.05	6.75	9.72	31.77	56.00	-24.23	16.47	46.00	-29.53
6	0.902	24.24	17.49	9.72	33.96	56.00	-22.04	27.21	46.00	-18.79
7	1.122	26.83	24.50	9.72	36.55	56.00	-19.45	34.22	46.00	-11.78
8	3.254	28.97	23.56	9.79	38.76	56.00	-17.24	33.35	46.00	-12.65
9	4.690	28.20	24.48	9.83	38.03	56.00	-17.97	34.31	46.00	-11.69
10	21.990	29.54	25.47	10.08	39.62	60.00	-20.38	35.55	50.00	-14.45

Address:No. 120, Lane 180, Hsin Ho Rd., Lung-Tan Dist.,
Tao Yuan City 325, Taiwan.
Tel:03-4071718

Conducted Emission Measurement

Date: 2016/8/15

operator: Jiin Lee
Temperature: 26 ℃
Humidity: 54 %



Site: Conduction 04 Phase: *N*

Limit: CISPR22 Class B Conduction(QP)

No.	Frequency (MHz)	QP_R (dBuV)	AVG_R (dBuV)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)
1	0.154	34.35	25.57	9.68	44.03	65.78	-21.75	35.25	55.78	-20.53
2	0.302	39.60	38.18	9.68	49.28	60.19	-10.91	47.86	50.19	-2.33
3	0.518	28.60	24.04	9.69	38.29	56.00	-17.71	33.73	46.00	-12.27
4	0.706	24.85	18.79	9.69	34.54	56.00	-21.46	28.48	46.00	-17.52
5	0.970	27.08	24.45	9.70	36.78	56.00	-19.22	34.15	46.00	-11.85
6	1.122	26.44	24.18	9.70	36.14	56.00	-19.86	33.88	46.00	-12.12
7	2.542	27.07	19.07	9.76	36.83	56.00	-19.17	28.83	46.00	-17.17
8	2.650	28.55	22.80	9.76	38.31	56.00	-17.69	32.56	46.00	-13.44
9	3.102	28.48	21.54	9.77	38.25	56.00	-17.75	31.31	46.00	-14.69
10	4.606	28.48	24.72	9.82	38.30	56.00	-17.70	34.54	46.00	-11.46
11	21.934	29.98	25.85	10.20	40.18	60.00	-19.82	36.05	50.00	-13.95

6 PEAK OUTPUT POWER/ERIP MEASUREMENT

6.1 Standard Applicable:

According to §15.247(b)(3),(4)(b)

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

According to RSS-247 issue 1,§5.4

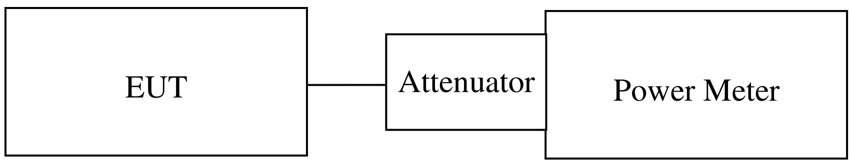
(4) For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

As an alternative to a peak power measurement, compliance can be based on a measurement of the maximum conducted output power. The maximum conducted output power is the total transmit power delivered to all antennas and antenna elements, averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or transmitting at a reduced power level. If multiple modes of operation are implemented, the maximum conducted output power is the highest total transmit power occurring in any mode.

6.2 Measurement Equipment Used:

Conducted Emission Test Site					
EQUIPMENT TYPE	**MFR**	**MODEL NUMBER**	**SERIAL NUMBER**	**LAST CAL.**	**CAL DUE.**
Power Meter 05	Anritsu	ML2495A	1116010	07/28/2016	07/27/2017
Power Sensor 05	Anritsu	MA2411B	34NKF50	07/28/2016	07/27/2017
Power Sensor 06	DARE	RPR3006W	13I00030SNO33	11/03/2015	11/02/2016
Power Sensor 07	DARE	RPR3006W	13I00030SNO34	11/03/2015	11/02/2016
Temperature Chamber	KSON	THS-B4H100	2287	06/28/2016	06/27/2017
DC Power supply	ABM	8185D	N/A	09/05/2015	09/04/2016
AC Power supply	EXTECH	CFC105W	NA	12/26/2015	12/25/2016
Attenuator	Woken	Watt-65m3502	11051601	NA	NA
Splitter	MCLI	PS4-199	12465	12/26/2015	12/25/2017
Spectrum analyzer	Agilent	N9030A	MY51360021	10/02/2015	10/01/2016
Test Sofware	DARE	Radimation Ver:2013.1.23	NA	NA	NA

6.3 Test Set-up:



6.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power meter
3. Record the max. reading.
4. Repeat above procedures until all frequency measured were complete.

6.5 Measurement Result:

802.11b

Cable loss = 0	Output Power		Limit
CH	Detector		(dBm)
	PK (dBm)	AV (dBm)	
Low		13.51	30.00
Mid	19.42	13.36	
High	18.88	13.14	

802.11g

Cable loss = 0	Output Power		Limit
CH	Detector		(dBm)
	PK (dBm)	AV (dBm)	
Low	22.26	10.25	30.00
Mid	22.24	10.19	
High	22.17	10.14	

802.11N HT20

Cable loss = 0	Output Power		Limit
CH	Detector		(dBm)
	PK (dBm)	AV (dBm)	
Low	22.14	10.11	30.00
Mid	22.17	10.08	
High	22.08	10.02	

802.11N HT40

Cable loss = 0	Output Power		Limit
CH	Detector		(dBm)
	PK (dBm)	AV (dBm)	
Low	22.03	7.21	30.00
Mid	22.17	7.18	
High	22.13	7.07	

7 6dB Bandwidth & 99% Bandwidth

7.1 Standard Applicable:

According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

According to RSS-247 issue 1, §5.2

(1) The minimum 6 dB bandwidth shall be 500 kHz.

7.2 Measurement Equipment Used:

Refer to section 6.2 for details.

7.3 Test Set-up:

Refer to section 6.3 for details.

7.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=100KHz, VBW = 3*RBW, Span= cover the complete power envelope of the signal of the UUT Sweep=auto
4. Mark the peak frequency and –6dB (upper and lower) frequency.
5. Repeat above procedures until all frequency measured were complete.

7.5 Measurement Result:

802.11b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
Low	10.21	13.433	> 500	PASS
Mid	10.21	13.634	> 500	PASS
High	10.21	14.160	> 500	PASS

802.11g

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
Low	16.45	16.748	> 500	PASS
Mid	16.45	16.762	> 500	PASS
High	16.44	16.811	> 500	PASS

802.11n_20M

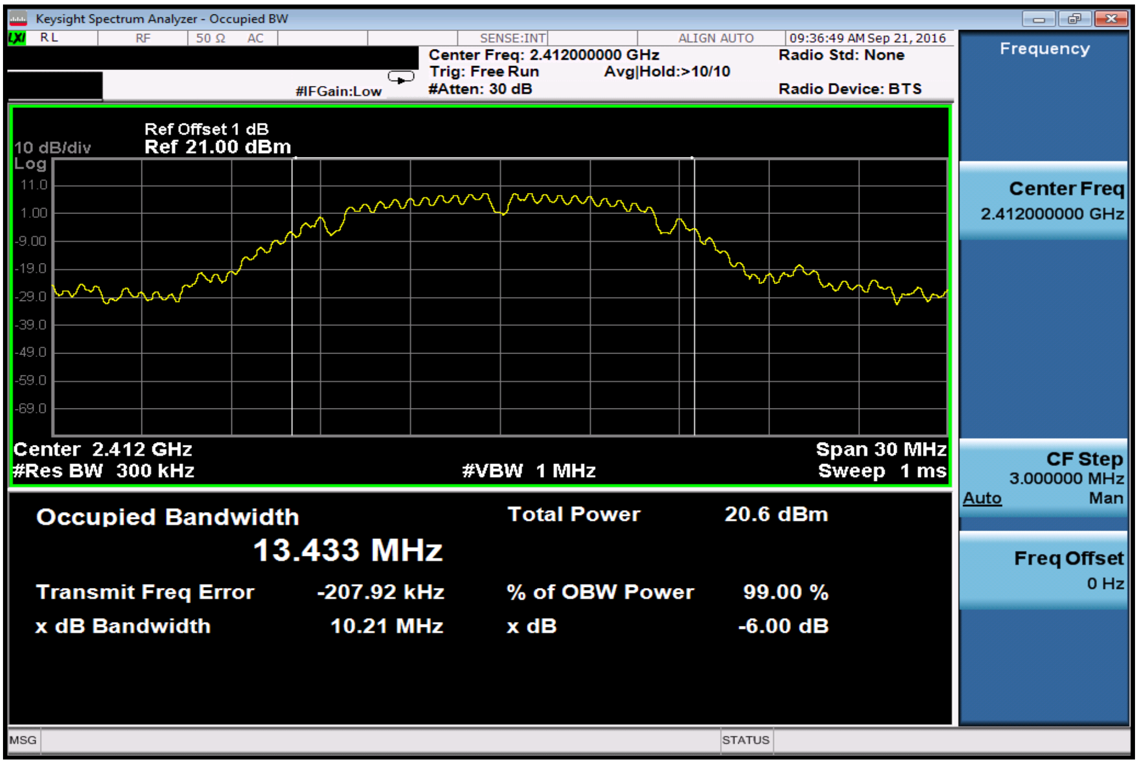
Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
Low	17.63	17.699	> 500	PASS
Mid	17.62	17.720	> 500	PASS
High	17.58	17.691	> 500	PASS

802.11n_40M

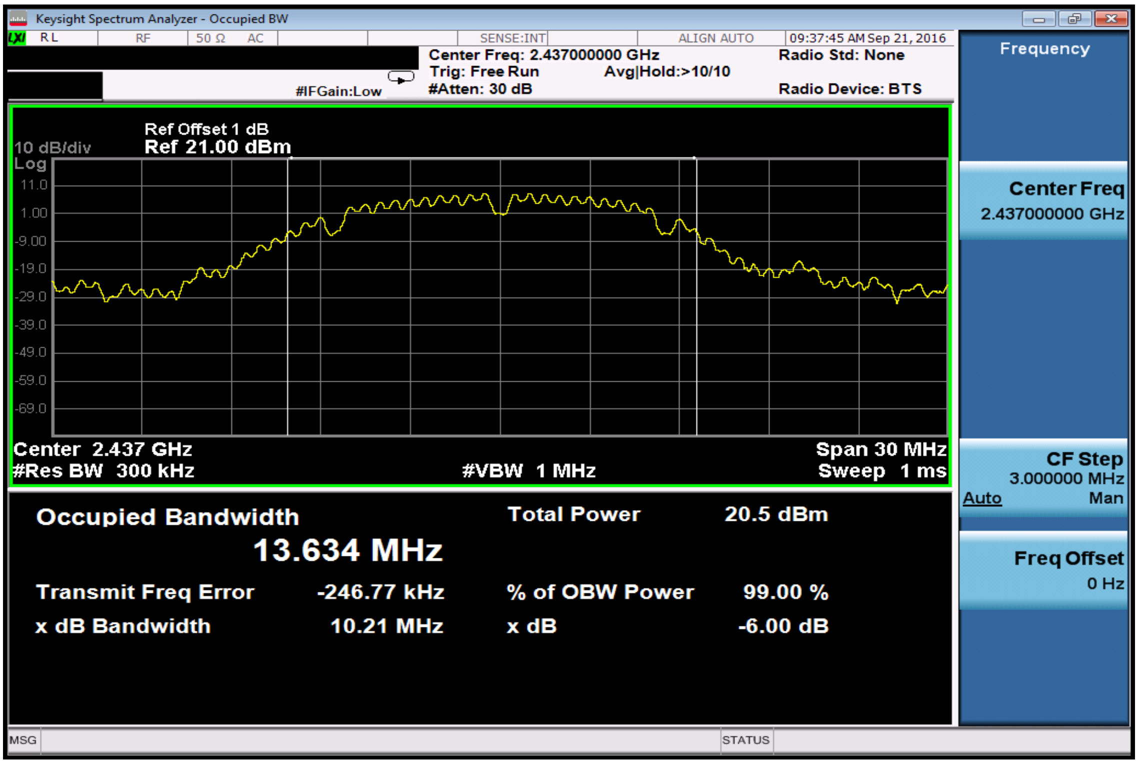
Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
Low	35.95	36.191	> 500	PASS
Mid	36.25	36.205	> 500	PASS
High	35.98	36.189	> 500	PASS

802.11b

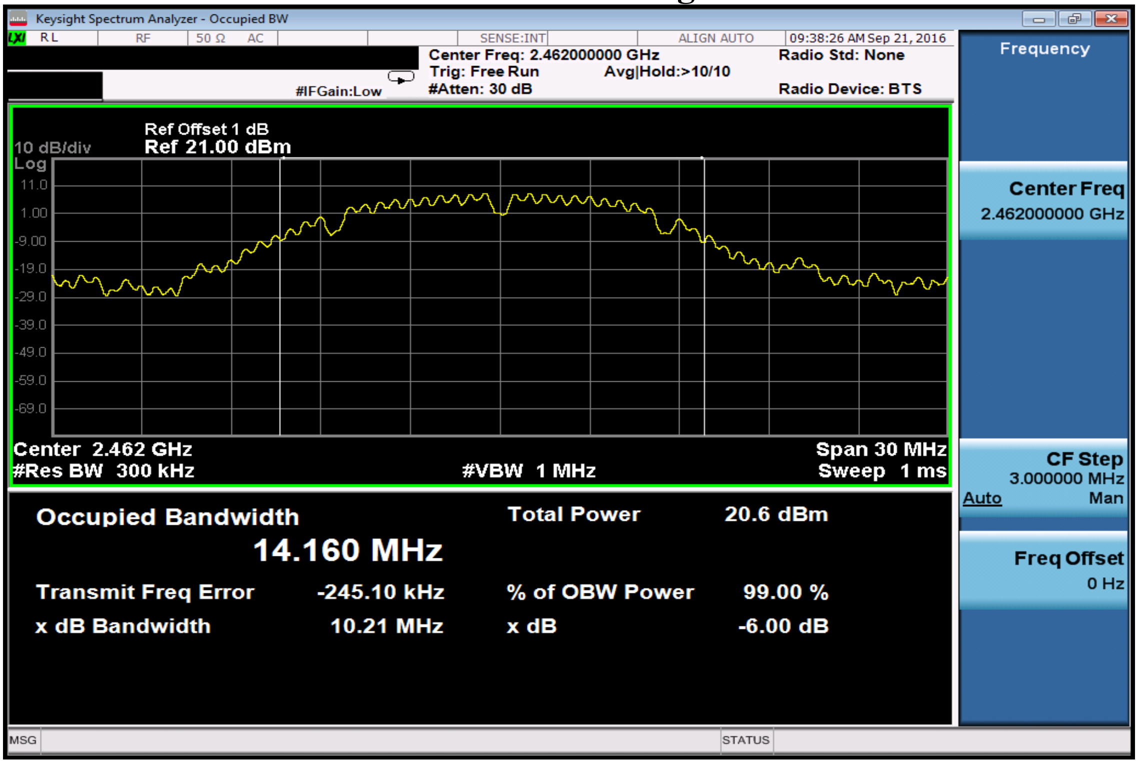
6dB & 99% Band Width Test Data CH-Low



6dB & 99% Band Width Test Data CH-Mid

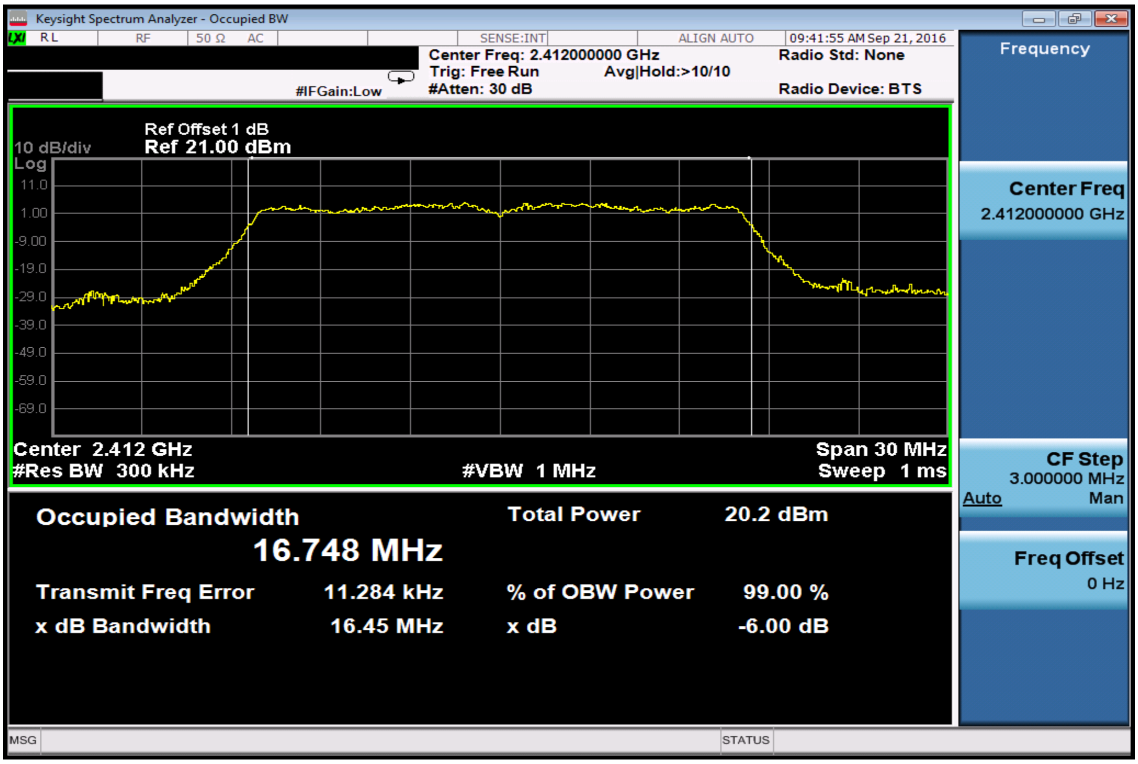


6dB & 99% Band Width Test Data CH-High

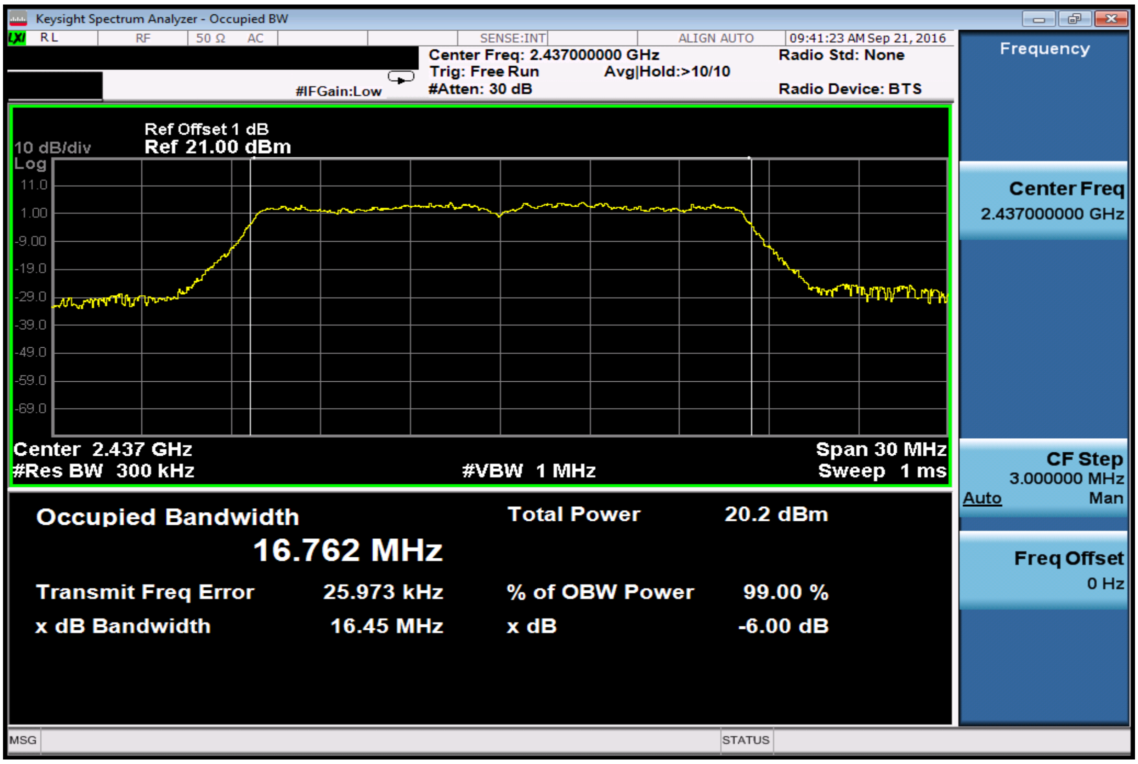


802.11g

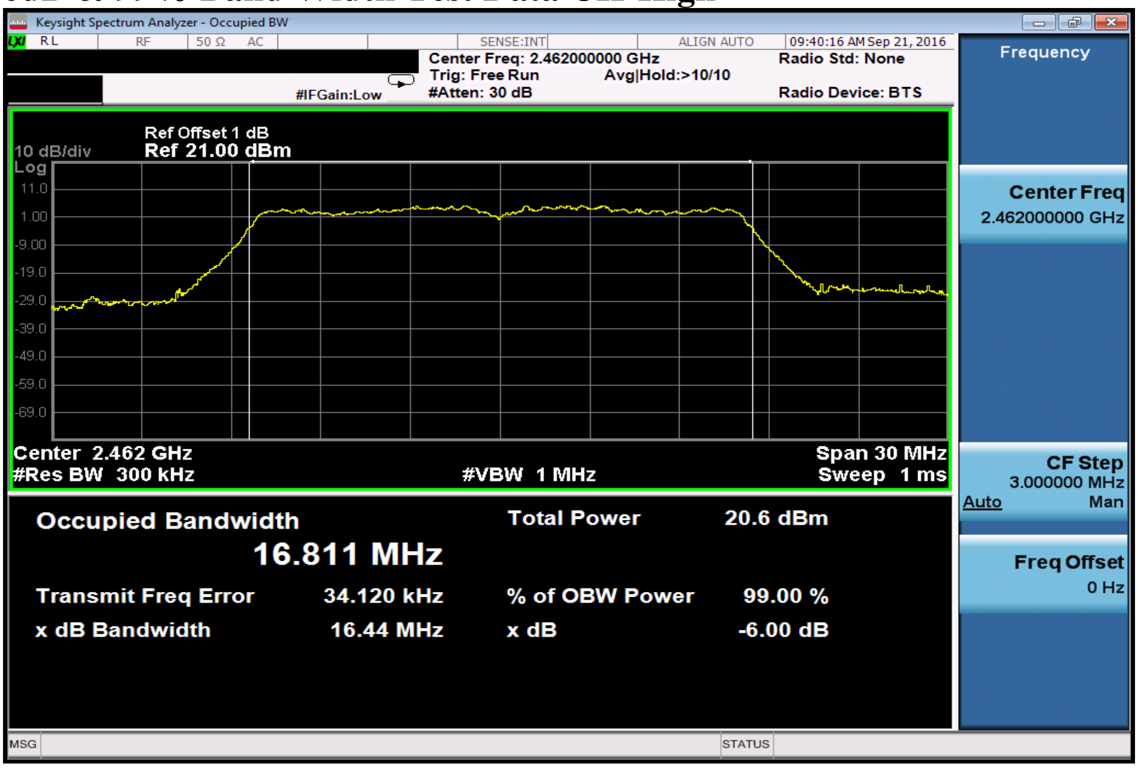
6dB & 99% Band Width Test Data CH-Low



6dB & 99% Band Width Test Data CH-Mid

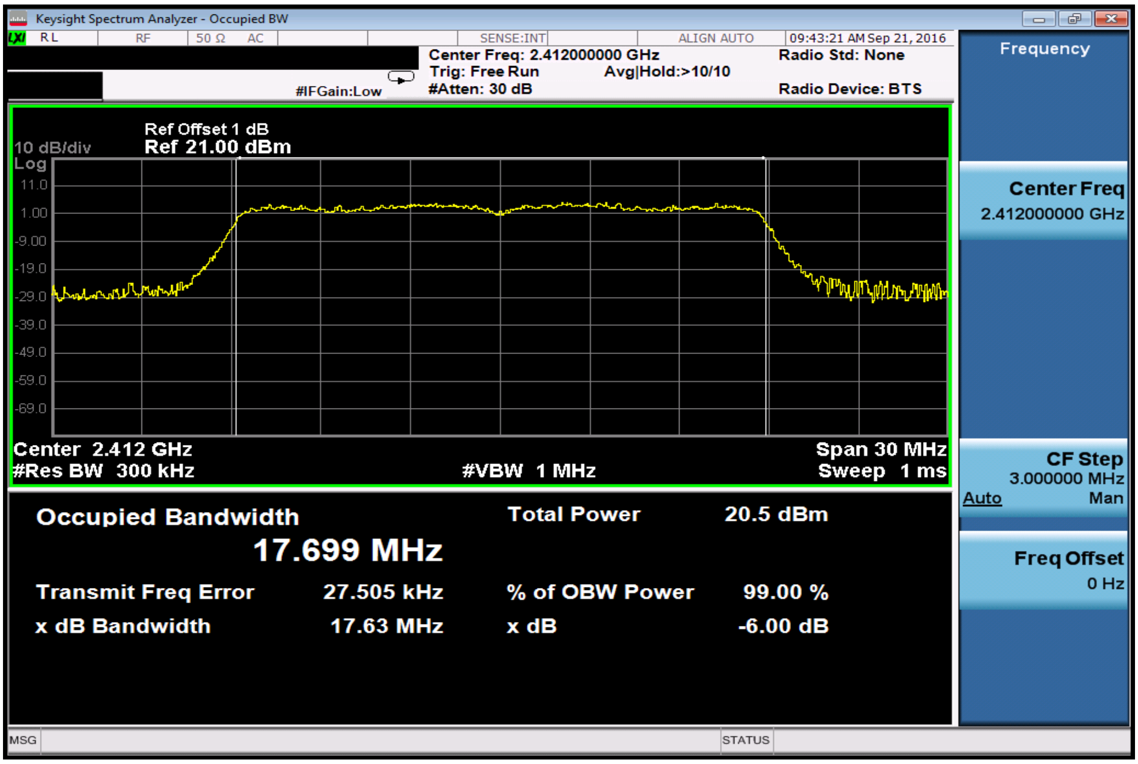


6dB & 99% Band Width Test Data CH-High

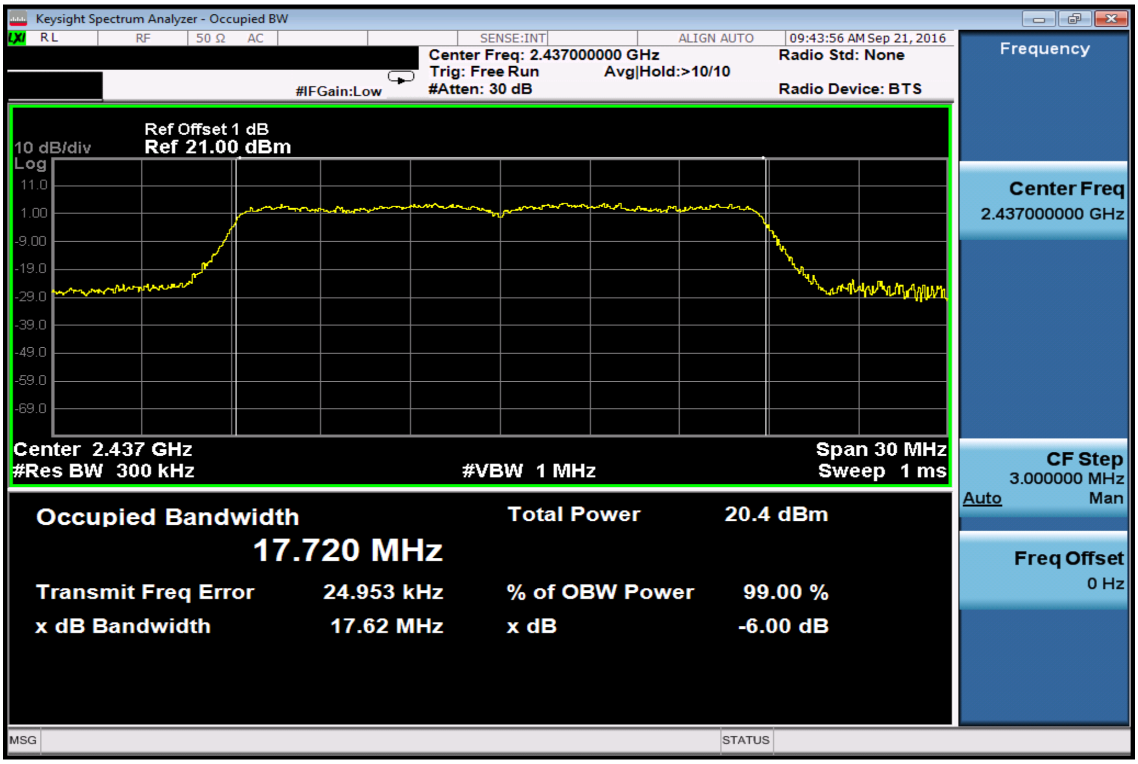


802.11n_20M

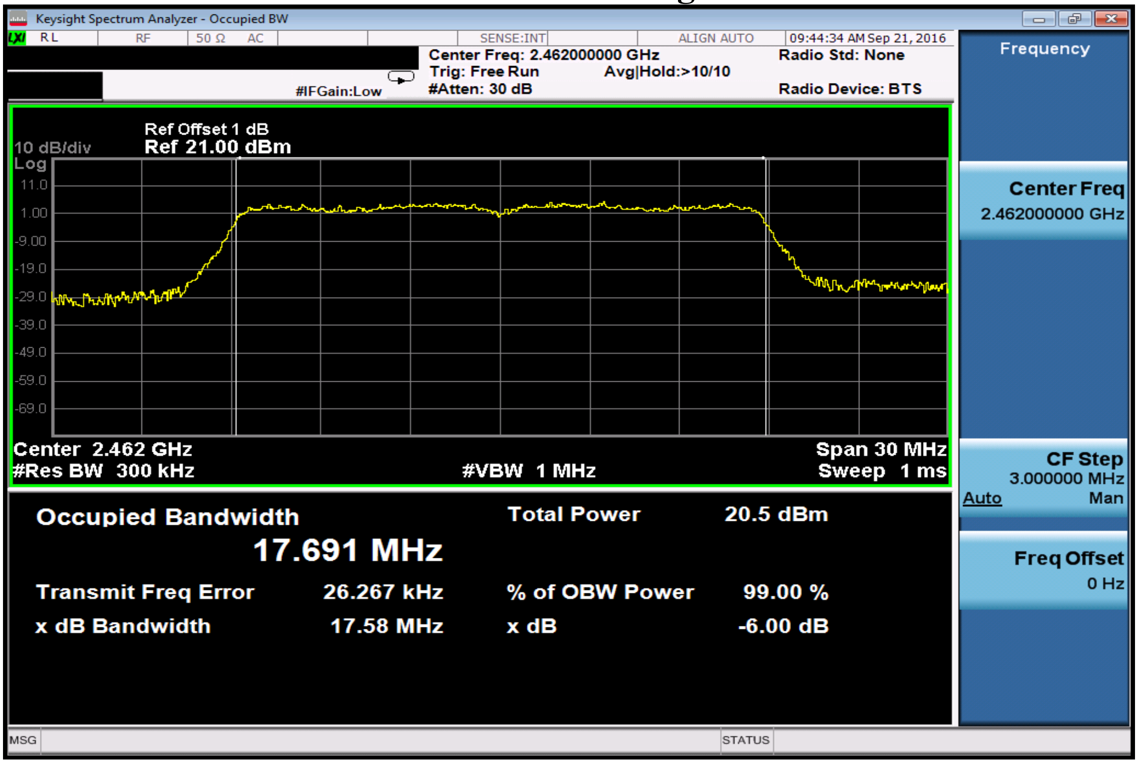
6dB & 99% Band Width Test Data CH-Low



6dB & 99% Band Width Test Data CH-Mid

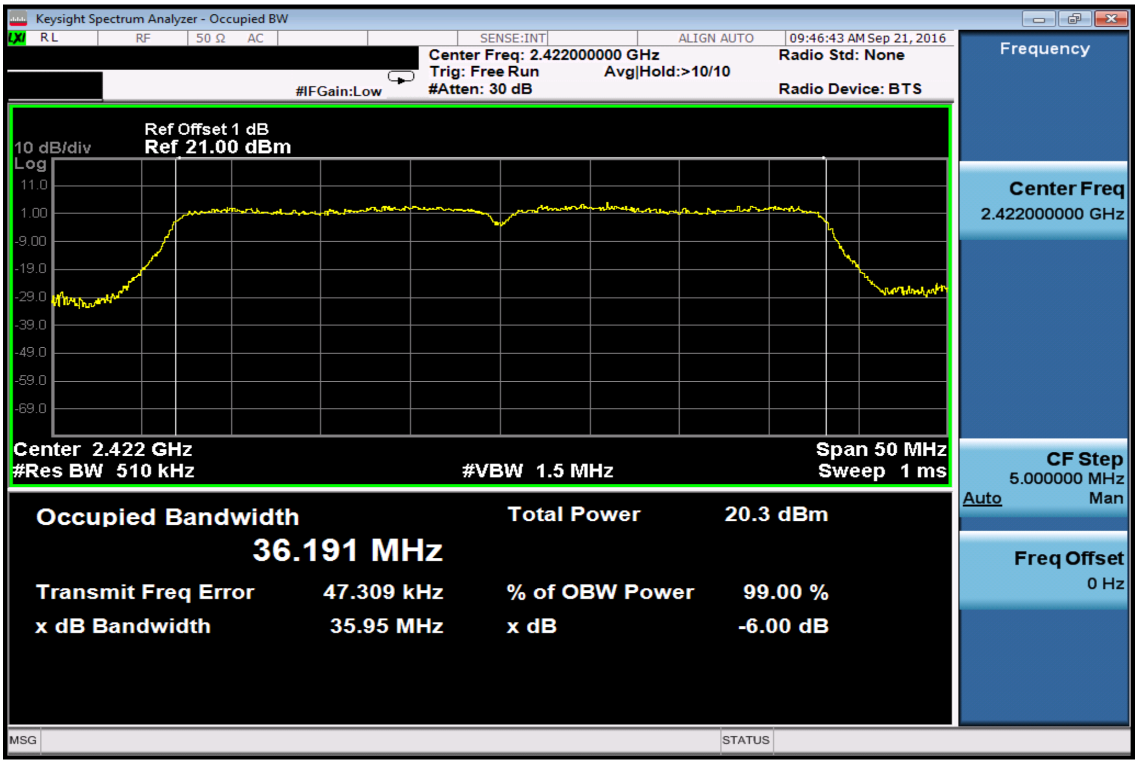


6dB & 99% Band Width Test Data CH-High

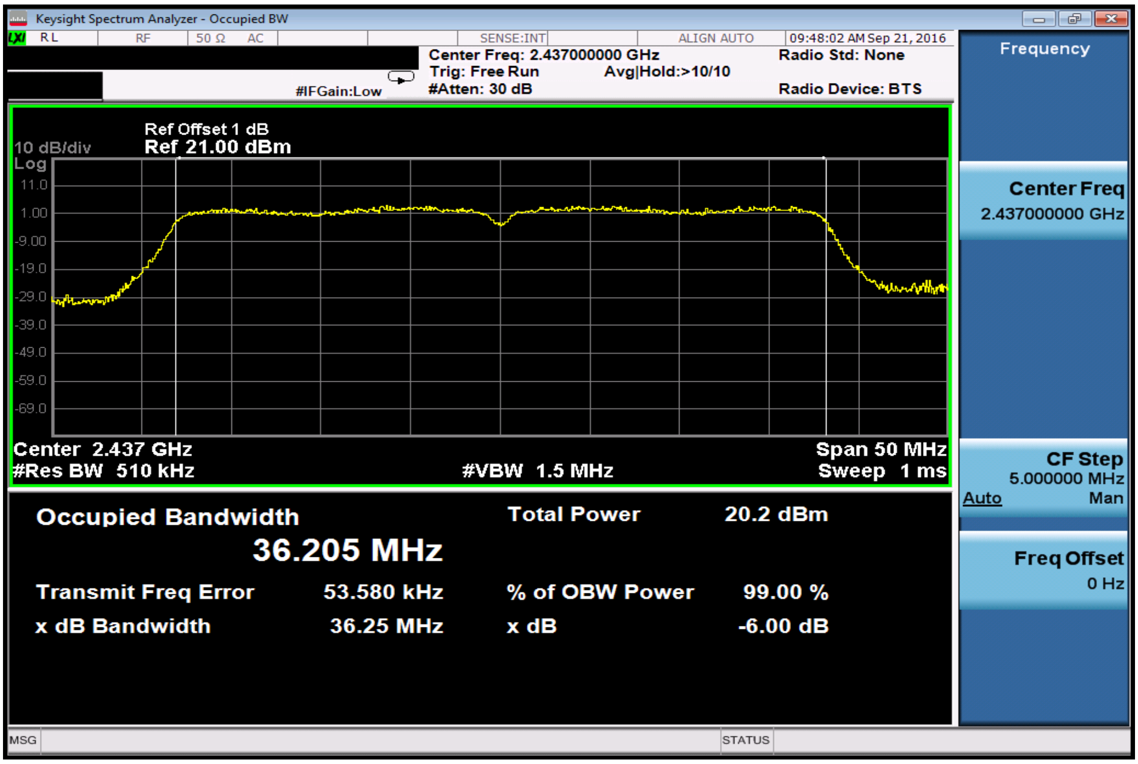


802.11n_40M

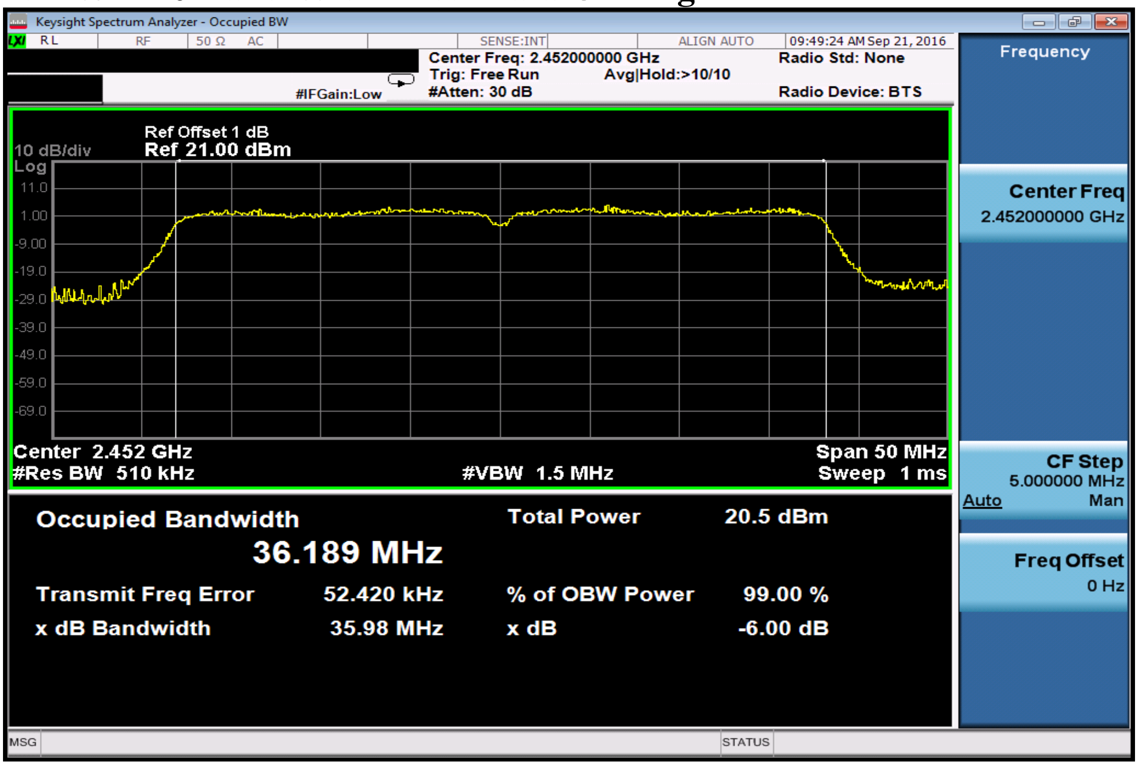
6dB & 99% Band Width Test Data CH-Low



6dB & 99% Band Width Test Data CH-Mid



6dB & 99% Band Width Test Data CH-High



8 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable:

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

According to RSS-247 issue 1, §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digi-tally modulated device is operating, the RF power that is produced shall be at least 20 dB be-low that in the 100 kHz bandwidth within the band that contains the highest level of the de-sired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demon-strates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenua-tion below the general field strength limits specified in RSS-Gen is not required.

8.2 Measurement Equipment Used:

8.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2 Radiated emission:

Chamber 14(966)					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Spectrum Analyzer 21(26.5GHz)	Agilent	N9010A	MY49060537	07/29/2016	07/28/2017
Spectrum Analyzer 20(6.5GHz)	Agilent	E4443A	MY48250315	05/20/2016	05/19/2017
Spectrum Analyzer 22(43GHz)	R&S	FSU43	100143	05/22/2016	05/21/2017
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	06/17/2015	06/16/2017
Bilog Antenna30-1G	SCHWARZBECK	VULB9168	644	03/02/2016	03/01/2017
Horn antenna1-18G	ETS	3117	00066665	11/30/2015	11/29/2016
Horn antenna26-40G(05)	Com-power	AH-640	100A	01/21/2015	01/20/2017
Horn antenna18-26G(04)	Com-power	AH-826	081001	07/24/2015	07/23/2017
Preamplifier9-1000M	HP	8447D	NA	03/09/2016	03/08/2017
Preamplifier1-18G	MITEQ	AFS44-001018 00-25-10P-44	1329256	07/27/2016	07/26/2017
Preamplifier1-26G	EM	EM01M26G	NA	03/10/2016	03/09/2017
Preamplifier26-40G	MITEQ	JS-26004000-2 7-5A	818471	07/23/2015	07/22/2017
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	11/25/2015	11/24/2016
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	10/02/2015	10/01/2016
SUCOFLEX 1GHz~40GHz cable	HUBER SUHNER	Sucoflex 102	27963/2&3742 1/2	11/03/2015	11/02/2017
2.4G Filter	Micro-Tronics	Brm50702	76	12/26/2015	12/25/2016
5G Filter	Micro-Tronics	Brm50716	005	12/26/2015	12/25/2016
Test Software	Audix	E3 Ver:6.12023	N/A	N/A	N/A
Test Software	Farad	EZEMC Ver:ISL-03A2	N/A	N/A	N/A

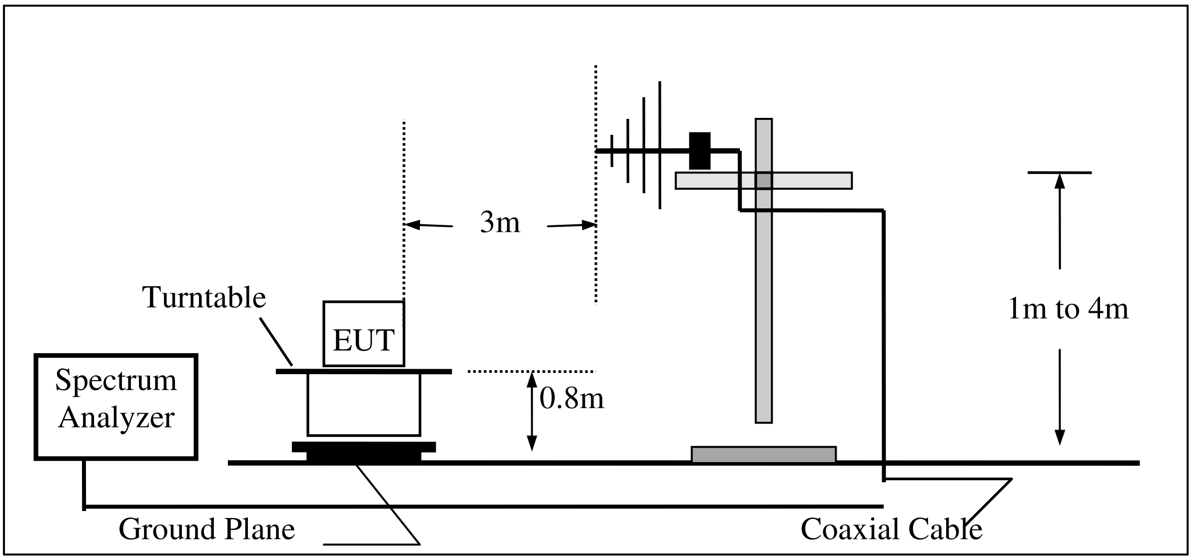
8.3 Test SET-UP:

8.3.1 Conducted Emission at antenna port:

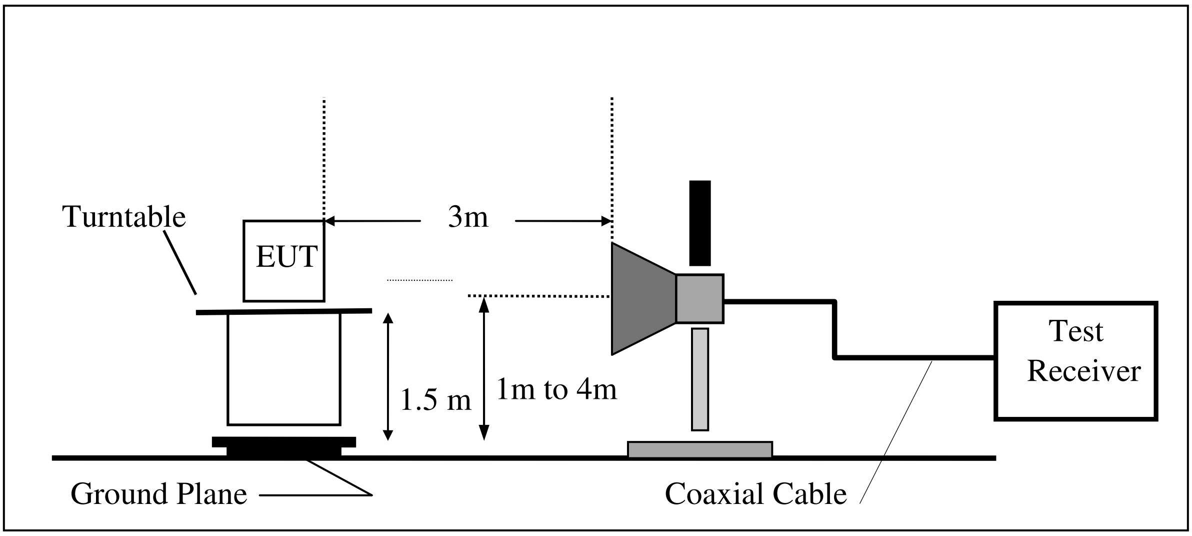
Refer to section 6.3 for details.

8.3.2 Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



8.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set center frequency of spectrum analyzer = operating frequency.
4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
6. Repeat above procedures until all frequency measured were complete.

8.5 Field Strength Calculation:

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

8.6 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Radiated Emission: 802.11 g mode (worst case)

Operation Mode	TX CH Low	Test Date	2016/08/10
Channel Number	2412 MHz	Test By	Lake
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2390.00	19.87	31.71	51.58	54.00	-2.42	Average	VERTICAL
2	2390.00	34.07	31.71	65.78	74.00	-8.22	Peak	VERTICAL
3	2400.00	37.21	31.74	68.95	81.44	-12.49	Peak	VERTICAL
4	2408.34	69.68	31.76	101.44	F	--	Peak	VERTICAL
1	2390.00	21.63	31.71	53.34	54.00	-0.66	Average	HORIZONTAL
2	2390.00	35.38	31.71	67.09	74.00	-6.91	Peak	HORIZONTAL
3	2400.00	40.45	31.74	72.19	85.47	-13.28	Peak	HORIZONTAL
4	2409.23	73.71	31.76	105.47	F	--	Peak	HORIZONTAL

Remark:

1. Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
2. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
3. Measurement of data within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
5. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Note: "F" denotes fundamental frequency

Operation Mode	TX CH High	Test Date	2016/08/10
Channel Number	2462 MHz	Test By	Lake
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	2483.50	16.34	31.98	48.32	54.00	-5.68	Average	VERTICAL
2	2483.50	34.23	31.98	66.21	74.00	-7.79	Peak	VERTICAL
1	2483.50	20.50	31.98	52.48	54.00	-1.52	Average	HORIZONTAL
2	2483.50	38.21	31.98	70.19	74.00	-3.81	Peak	HORIZONTAL

Remark:

1. Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
2. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
3. Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
4. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
5. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Note: “F” denotes fundamental frequency

9 SPURIOUS RADIATED EMISSION TEST

9.1 Standard Applicable

According to §15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in §15.209(a). And according to §15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

According to RSS-247 issue 1, §5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digi-tally modulated device is operating, the RF power that is produced shall be at least 20 dB be-low that in the 100 kHz bandwidth within the band that contains the highest level of the de-sired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

9.2 Measurement Equipment Used:

9.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

9.2.2 Radiated emission:

Refer to section 7.2 for details.

9.3 Test SET-UP:

9.3.1 Conducted Emission at antenna port:

Refer to section 6.3 for details.

9.3.2 Radiated emission:

Refer to section 7.3 for details.

9.4 Measurement Procedure:

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made “while keeping the antenna in the ‘cone of radiation’ from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response.” is still within the 3dB illumination BW of the measurement antenna.
5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
7. Repeat above procedures until all frequency measured were complete.

9.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

9.6 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.

Radiated Spurious Emission Measurement Result (below 1GHz) (worst case: 802.11g mode)

Operation Mode	TX CH Low	Test Date	2016/08/10
Channel Number	2412MHz	Test By	Lake
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	199.75	53.20	-14.80	38.40	43.50	-5.10	Peak	VERTICAL
2	250.19	52.26	-12.84	39.42	46.00	-6.58	Peak	VERTICAL
3	399.57	44.09	-9.03	35.06	46.00	-10.94	Peak	VERTICAL
4	450.01	44.55	-7.91	36.64	46.00	-9.36	Peak	VERTICAL
5	749.74	43.45	-2.83	40.62	46.00	-5.38	Peak	VERTICAL
6	849.65	38.28	-1.35	36.93	46.00	-9.07	Peak	VERTICAL
1	199.75	49.35	-14.80	34.55	43.50	-8.95	Peak	HORIZONTAL
2	250.19	51.17	-12.84	38.33	46.00	-7.67	Peak	HORIZONTAL
3	350.10	48.08	-10.06	38.02	46.00	-7.98	Peak	HORIZONTAL
4	450.01	44.70	-7.91	36.79	46.00	-9.21	Peak	HORIZONTAL
5	518.88	42.32	-7.07	35.25	46.00	-10.75	Peak	HORIZONTAL
6	549.92	44.22	-6.53	37.69	46.00	-8.31	Peak	HORIZONTAL

Remark:

1. No further spurious emissions detected from the lowest internal frequency and 30MHz.
2. Measuring frequencies from the lowest internal frequency to the 1GHz.
3. Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
4. Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH Mid	Test Date	2016/08/10
Channel Number	2437MHz	Test By	Lake
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	199.75	53.32	-14.80	38.52	43.50	-4.98	Peak	VERTICAL
2	250.19	52.95	-12.84	40.11	46.00	-5.89	Peak	VERTICAL
3	450.01	44.67	-7.91	36.76	46.00	-9.24	Peak	VERTICAL
4	518.88	43.34	-7.07	36.27	46.00	-9.73	Peak	VERTICAL
5	749.74	44.54	-2.83	41.71	46.00	-4.29	Peak	VERTICAL
6	849.65	38.58	-1.35	37.23	46.00	-8.77	Peak	VERTICAL
1	199.75	49.25	-14.80	34.45	43.50	-9.05	Peak	HORIZONTAL
2	250.19	51.73	-12.84	38.89	46.00	-7.11	Peak	HORIZONTAL
3	350.10	48.49	-10.06	38.43	46.00	-7.57	Peak	HORIZONTAL
4	450.01	44.67	-7.91	36.76	46.00	-9.24	Peak	HORIZONTAL
5	549.92	44.24	-6.53	37.71	46.00	-8.29	Peak	HORIZONTAL
6	700.27	37.96	-4.03	33.93	46.00	-12.07	Peak	HORIZONTAL

Remark:

1 No further spurious emissions detected from the lowest internal frequency and 30MHz.

2 Measuring frequencies from the lowest internal frequency to the 1GHz.

3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP

4 Measurement result within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (below 1GHz)

Operation Mode	TX CH High	Test Date	2016/08/10
Channel Number	2462MHz	Test By	Lake
Temperature	25 ℃	Humidity	60 %

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	199.75	52.98	-14.80	38.18	43.50	-5.32	Peak	VERTICAL
2	250.19	52.63	-12.84	39.79	46.00	-6.21	Peak	VERTICAL
3	450.01	44.31	-7.91	36.40	46.00	-9.60	Peak	VERTICAL
4	557.68	43.25	-6.36	36.89	46.00	-9.11	Peak	VERTICAL
5	749.74	43.27	-2.83	40.44	46.00	-5.56	Peak	VERTICAL
6	849.65	38.13	-1.35	36.78	46.00	-9.22	Peak	VERTICAL
1	199.75	49.35	-14.80	34.55	43.50	-8.95	Peak	HORIZONTAL
2	250.19	51.67	-12.84	38.83	46.00	-7.17	Peak	HORIZONTAL
3	350.10	48.16	-10.06	38.10	46.00	-7.90	Peak	HORIZONTAL
4	450.01	44.57	-7.91	36.66	46.00	-9.34	Peak	HORIZONTAL
5	549.92	44.04	-6.53	37.51	46.00	-8.49	Peak	HORIZONTAL
6	700.27	38.25	-4.03	34.22	46.00	-11.78	Peak	HORIZONTAL

Remark:

1. No further spurious emissions detected from the lowest internal frequency and 30MHz.
2. Measuring frequencies from the lowest internal frequency to the 1GHz.
3. Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
4. Measurement result within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
5. The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.

Radiated Spurious Emission Measurement Result (above 1GHz) (worst case: 802.11g mode)

Operation Mode	TX CH Low	Test Date	2016/08/10
Channel Number	2412MHz	Test By	Lake
Temperature	25 ℃	Pol	Ver.
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	4824.00	42.66	-3.24	39.42	74.00	-34.58	Peak	VERTICAL
2	7236.00	46.44	4.06	50.50	74.00	-23.50	Peak	VERTICAL
1	4824.00	44.19	-3.24	40.95	74.00	-33.05	Peak	HORIZONTAL
2	7236.00	43.78	4.06	47.84	74.00	-26.16	Peak	HORIZONTAL

Remark:

1. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
2. Measurement of data within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
4. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH Mid	Test Date	2016/08/10
Channel Number	2437MHz	Test By	Lake
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	4874.00	41.27	-3.13	38.14	74.00	-35.86	Peak	VERTICAL
2	7311.00	37.55	4.20	41.75	54.00	-12.25	Average	VERTICAL
3	7311.00	49.69	4.20	53.89	74.00	-20.11	Peak	VERTICAL
1	4874.00	43.76	-3.13	40.63	74.00	-33.37	Peak	HORIZONTAL
2	7311.00	43.83	4.20	48.03	74.00	-25.97	Peak	HORIZONTAL

Remark:

1. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
2. Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
4. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

Radiated Spurious Emission Measurement Result (above 1GHz)

Operation Mode	TX CH High	Test Date	2016/08/10
Channel Number	2462MHz	Test By	Lake
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq MHz	Reading dBuV	Factor dB	Level dBuV/m	Limit dBuV/m	Over Limit dB	Remark	Pol V/H
1	4924.00	43.41	-3.02	40.39	74.00	-33.61	Peak	VERTICAL
2	7386.00	39.43	4.32	43.75	54.00	-10.25	Average	VERTICAL
3	7386.00	50.64	4.32	54.96	74.00	-19.04	Peak	VERTICAL
1	4924.00	42.26	-3.02	39.24	74.00	-34.76	Peak	HORIZONTAL
2	7386.00	48.46	4.32	52.78	74.00	-21.22	Peak	HORIZONTAL

Remark:

1. Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
2. Measurement of data within this frequency range shown “ - ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
3. Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
4. Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.

10 Peak Power Spectral Density

10.1 Standard Applicable:

According to §15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

According to RSS-247 issue 1, §5.2
(2)The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section 5.4(4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

10.2 Measurement Equipment Used:

Refer to section 6.2 for details.

10.3 Test Set-up:

Refer to section 6.3 for details.

10.4 Measurement Procedure:

1. Place the EUT on the table and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW =100KHz, VBW = 300KHz, Span =5 to 30% greater than emission BW, Sweep=Auto
4. Record the max. reading.
5. Repeat above procedures until all frequency measured were complete.

10.5 Measurement Result:

802.11b Mode

CH	Power Density Level dBm/3KHz	Maximum Limit (dBm)
Low	-6.783	8
Mid	-5.84	8
High	-6.971	8

802.11g Mode

CH	Power Density Level dBm/3KHz	Maximum Limit (dBm)
Low	-11.874	8
Mid	-12.146	8
High	-12.176	8

802.11n HT20

CH	Power Density Level dBm/3KHz	Maximum Limit (dBm)
Low	-11.161	8
Mid	-11.35	8
High	-11.931	8

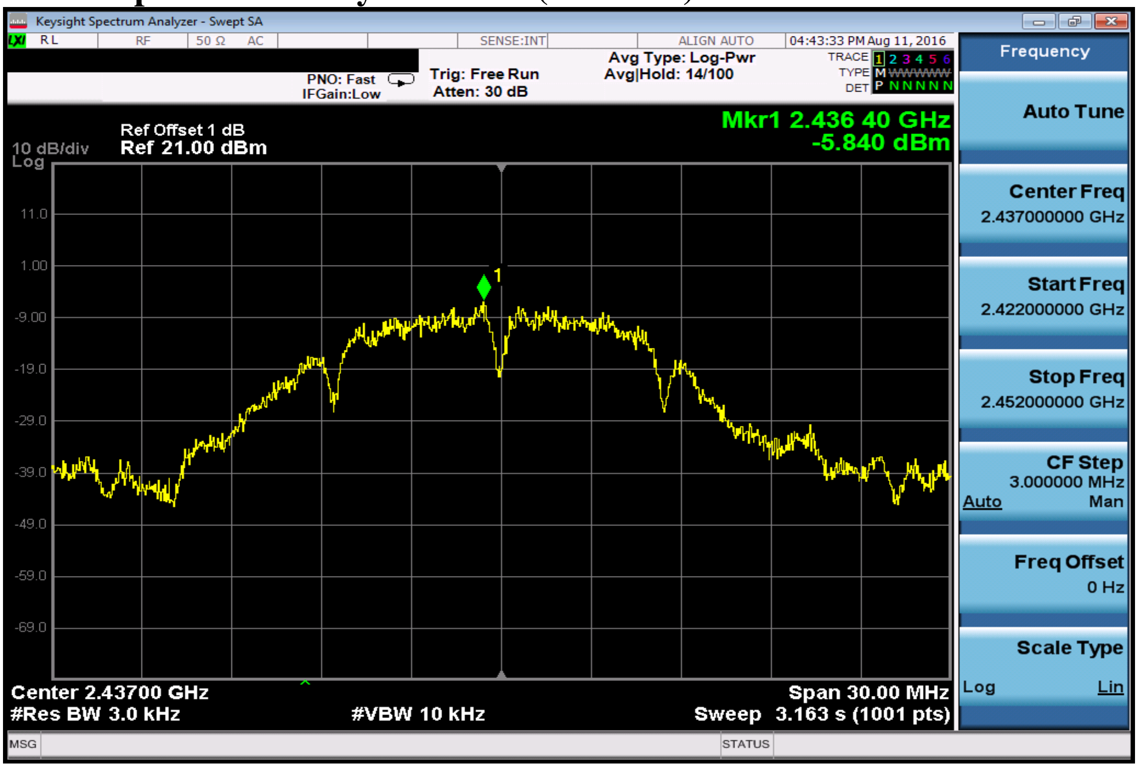
802.11n HT40

CH	Power Density Level dBm/3KHz	Maximum Limit (dBm)
Low	-14.209	8
Mid	-15.189	8
High	-14.562	8

802.11b

Power Spectral Density Test Plot (CH-Low)

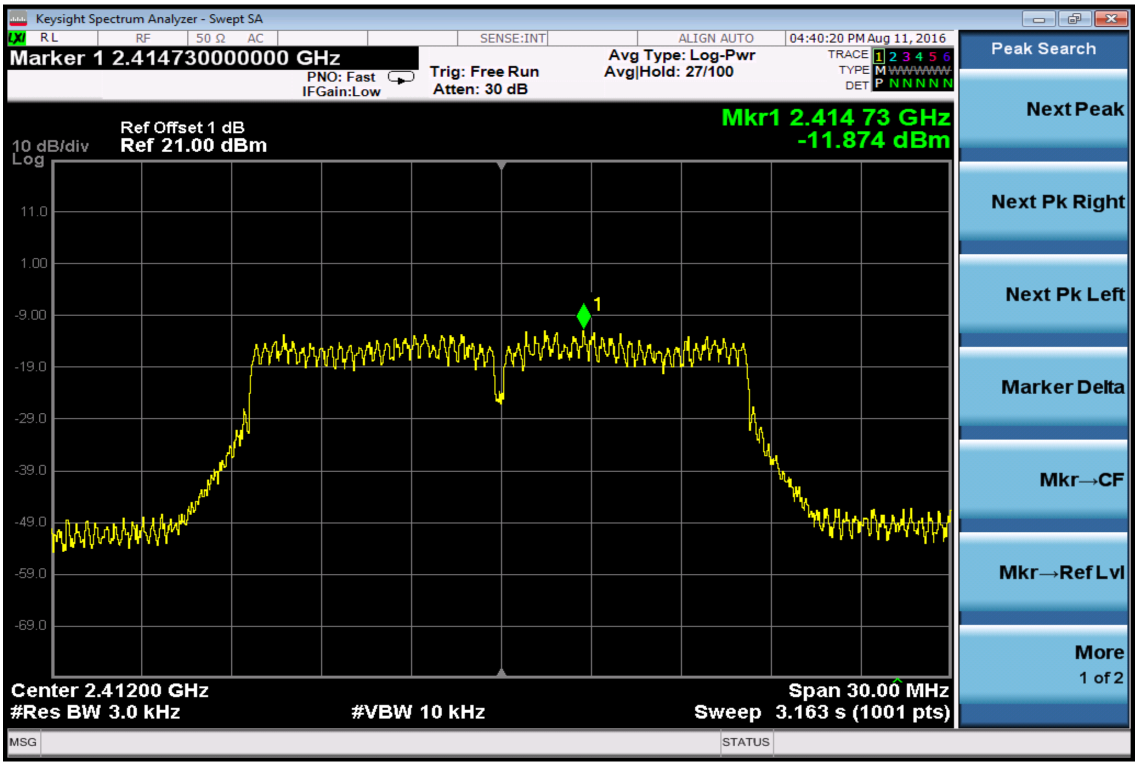
Power Spectral Density Test Plot (CH-Mid)



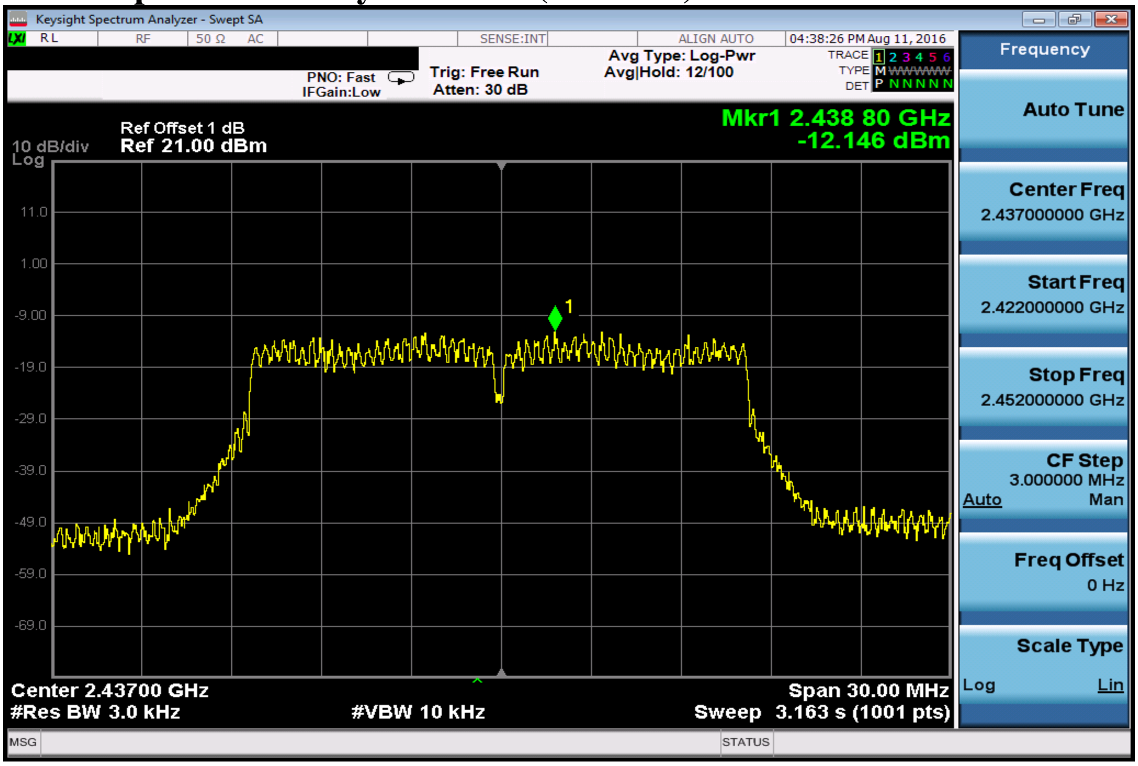
Power Spectral Density Test Plot (CH-High)

802.11g

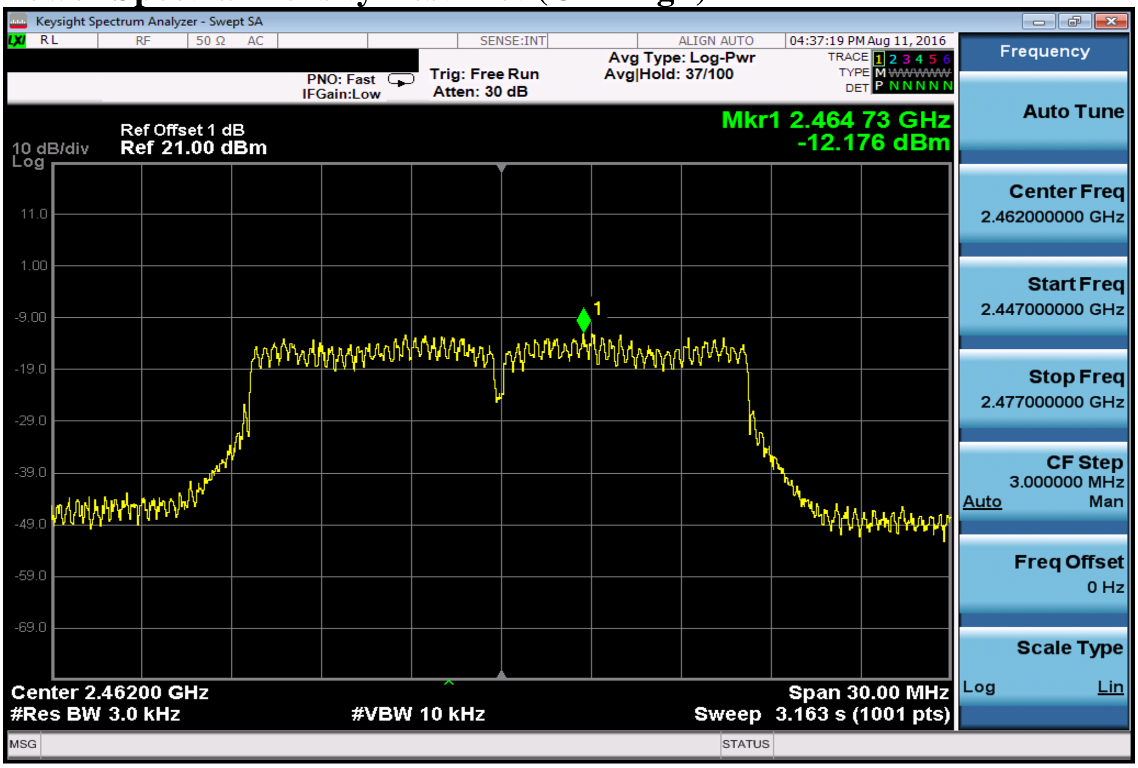
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

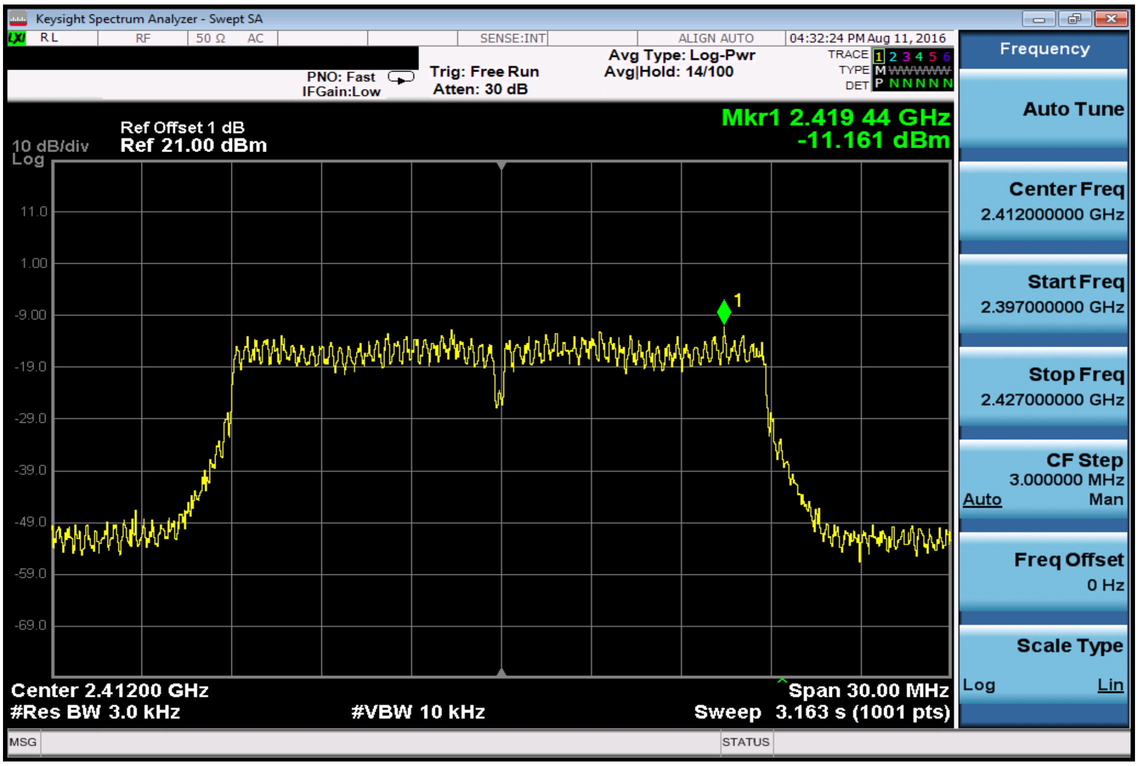


Power Spectral Density Test Plot (CH-High)

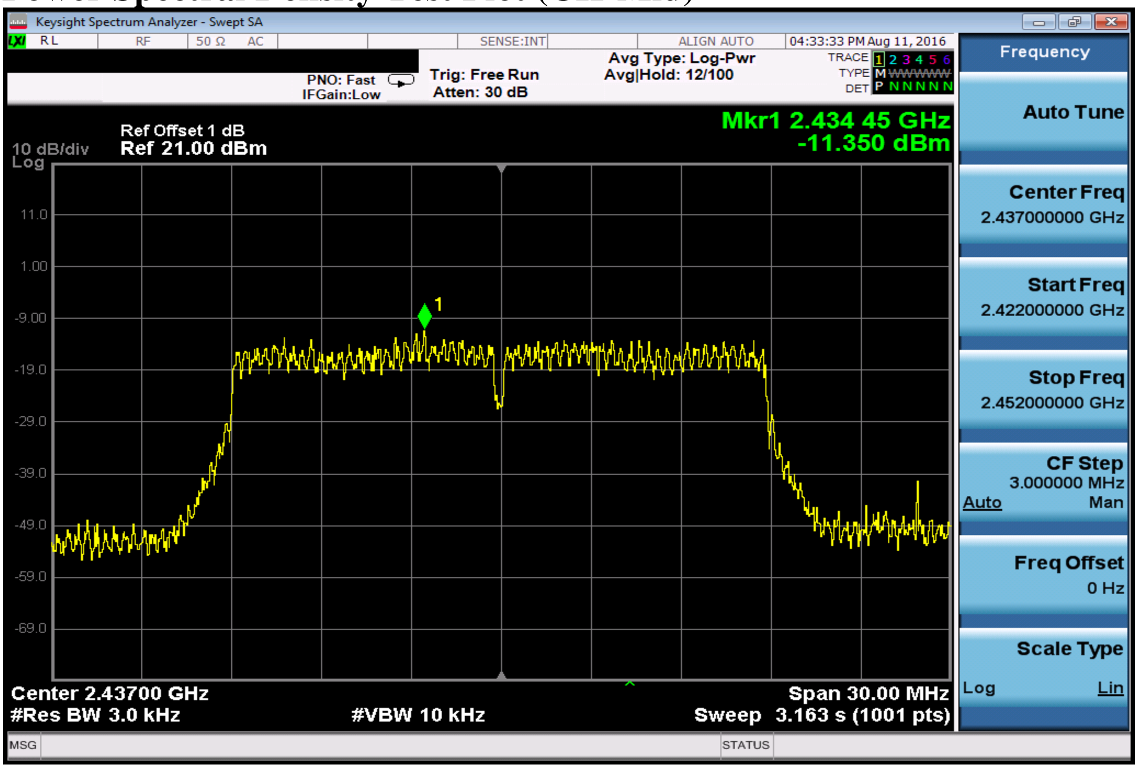


802.11n_20M

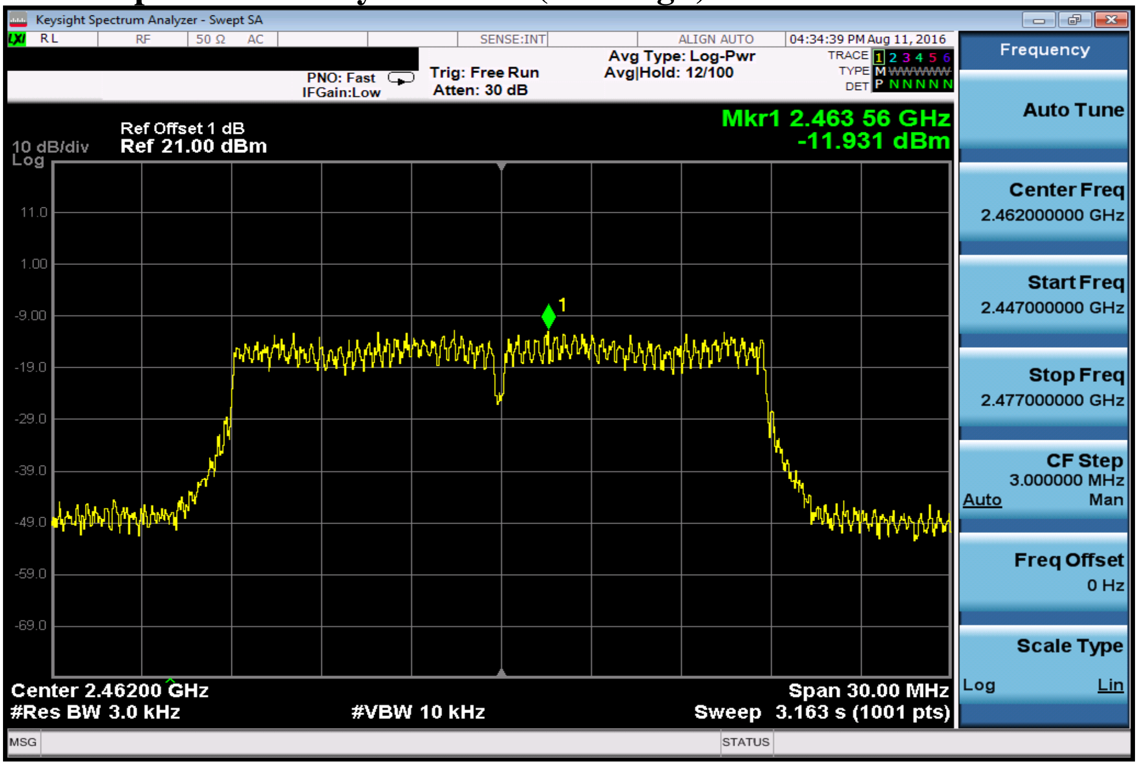
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)

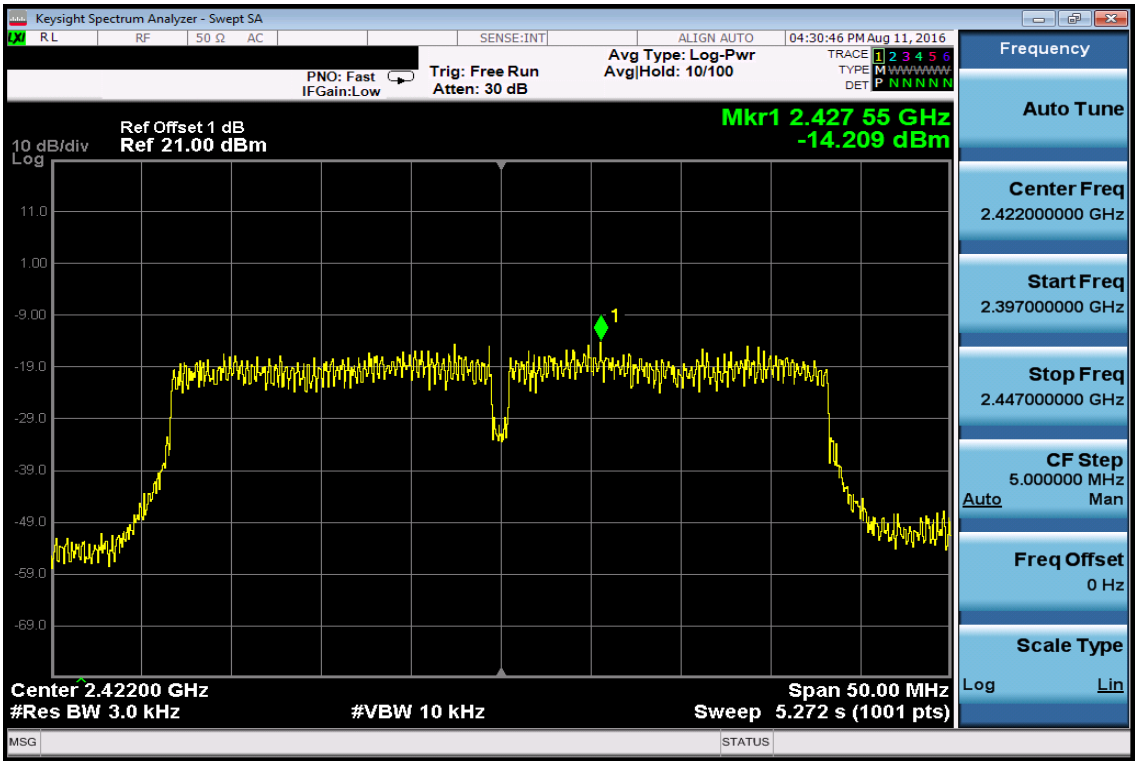


Power Spectral Density Test Plot (CH-High)

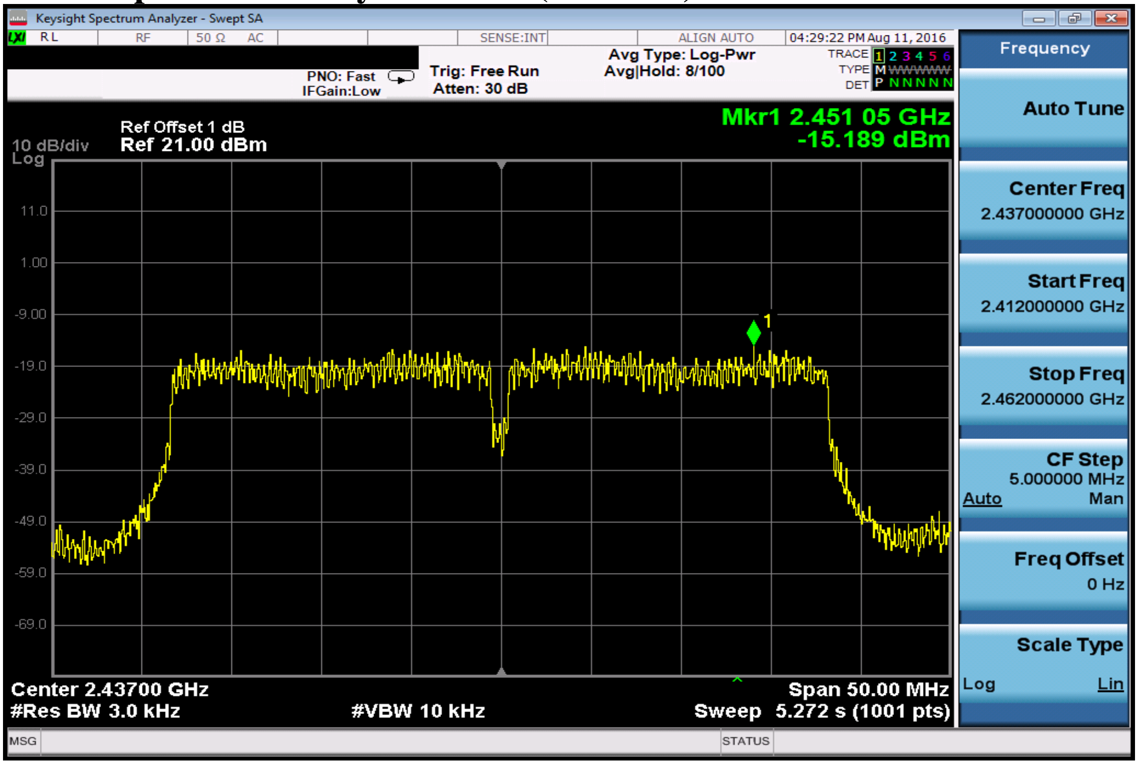


802.11n_40M

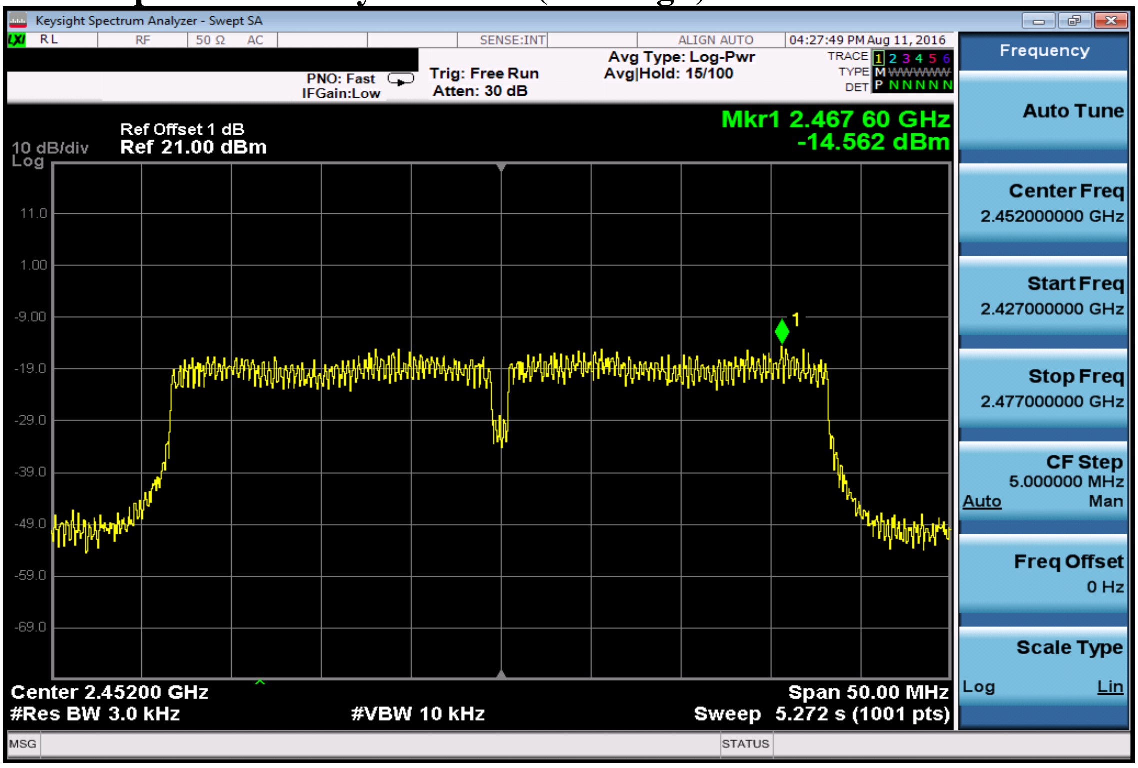
Power Spectral Density Test Plot (CH-Low)



Power Spectral Density Test Plot (CH-Mid)



Power Spectral Density Test Plot (CH-High)



11 ANTENNA REQUIREMENT

11.1 Standard Applicable:

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

According to RSS-GEN 7.1.2, a transmitter can only be sold or operated with antennas with which it was certified. A transmitter may be certified with multiple antenna types. An antenna type comprises antennas having similar in-band and out-of-band radiation patterns. Testing shall be performed using the highest-gain antenna of each combination of transmitter and antenna type for which certification is being sought, with the transmitter output power set at the maximum level. Any antenna of the same type and having equal or lesser gain as an antenna that had been successfully tested for certification with the transmitter, will also be considered certified with the transmitter, and may be used and marketed with the transmitter. The manufacturer shall include with the application for certification a list of acceptable antenna types to be used with the transmitter.

When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on measurement or on data from the antenna manufacturer. Any antenna gain in excess of 6 dBi (6 dB above isotropic gain) shall be added to the measured RF output power before using the power limits specified in RSS-210 or RSS-310 for devices of RF output powers of 10 milliwatts or less. For devices of output powers greater than 10 milliwatts, except devices subject to RSS-210 Annex 8 (Frequency Hopping and Digital Modulation Systems Operating in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz Bands) or RSS-210 Annex 9 (Local Area Network Devices), the total antenna gain shall be ad

ded to the measured RF output power before using the specified power limits. For devices subject to RSS-210 Annex 8 or Annex 9, the antenna gain shall not be added.

11.2 Antenna Connected Construction:

The directional gins of antenna used for transmitting is below table, and the antenna connector is designed with fixed type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.

	P/N	**Type**	**Gain (2.4GHz)**	**Gain (5GHz)**
Ant	AH 104N2450D1	Fixed Chip Antenna	2.1dBi	2.4dBi